



BOLETÍN DEL CENTRO DE INVESTIGACIONES BIOLÓGICAS

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Distributional note of the world species of *Paracymus* Thomson, 1867 (Coleoptera: Hydrophilidae) in five biogeographical regions

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ABSTRACT

An updated global catalog of the aquatic Coleoptera species of the genus *Paracymus* Thomson, 1867 is presented. This inventory covers the five biogeographic regions in which the genus is distributed, providing a complete and up-to-date overview of species diversity worldwide.

Key word: Biogeography, aquatic coleopteran, global distribution, species inventory, *Paracymus*.

Nota sobre la distribución mundial de *Paracymus* Thomson, 1867 (Coleoptera: Hydrophilidae) en cinco regiones biogeográficas

RESUMEN

Se presenta un catálogo global actualizado de las especies de coleópteros acuáticos del género *Paracymus* Thomson, 1867. Este inventario abarca las cinco regiones biogeográficas en las que se distribuye el género, proporcionando una visión completa y actualizada de la diversidad de especies a nivel mundial.

Palabras clave: Biogeografía, coleóptero acuático, distribución global, inventario de especies, *Paracymus*.

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INTRODUCCIÓN

A global distributional list of the species of the genus *Paracymus* Thomson, 1867 is compiled, considering the biogeographic divisions proposed by Morrone (2014). This list, based on a comprehensive review of the scientific literature, includes synonyms, detailed geographic distribution, and bibliographic references for each species, constituting a valuable resource for taxonomists, ecologists, and other researchers interested in this group of Coleoptera. This catalog provides a solid foundation for future taxonomic, biogeographic, and ecological research on this genus of aquatic Coleoptera. In order to understand the global distribution of the genus, a detailed distribution of the species is presented, segmented according to the five biogeographic regions where they live. This work offers a synthesis of the diversity of *Paracymus* on a global scale and its distribution in the different continents.

MATERIAL AND METHODS

The list of species presented in this study has been compiled from an exhaustive review of the existing scientific literature. We have relied primarily on the pioneering research of Wooldridge, who for several decades made fundamental contributions to the knowledge of this taxonomic group, publishing numerous papers between 1966 and 1989. Additionally, we have incorporated the findings of Gentili (2000), Minoshima (2014), and García and Jiménez-Ramos (2020, 2022) and García (2021, 2022ab, 2024), whose most recent work has significantly expanded our understanding of the diversity and distribution of these species.

To establish the biogeographic division of species, we have adopted the scheme proposed by Morrone (2014). This theoretical framework, widely recognized in the scientific community, allows us to locate species within specific biogeographic regions, which facilitates the comparison of distribution patterns and the identification of possible centers of origin and diversification.

RESULTS

Austral Kingdom Engler (1899)

Australian Region Sclater (1858)

Paracymus australiae Gentili, 2000: 118 – Australia.

Paracymus blandus Wooldridge, 1976: 455 – New Guinea.

Paracymus cariceti Gentili, 2000: 116 – Tasmania.

Paracymus desolatus Wooldridge, 1976: 458 – Northern and Western Australia.

Paracymus gigas Gentili 1996: 178; Hansen 1999: 111 – Western Australia.

Paracymus mirus Wooldridge, 1979: 831 – Papua.

Paracymus opacus Gentili, 2000: 118 – Australia.

Paracymus ovum Gentili, 2000: 116 – Australia.

Paracymus pacatus Wooldridge, 1976: 457 – New Guinea.

Paracymus pygmaeus Macleay, 1873: 133 – East and south of New Guinea.

Cyclonotum pygmaeum MacLeay, 1873: 133; White in Masters, 1871: 5.

Coelostoma pygmaeum (MacLeay): Zaitzev 1908: 404.

Paracymus pygmaeus (MacLeay): Blackburn, 1888: 820; 1894: 203; Knisch 1924: 167; d'Orchymont 1926: 377; 1937: 154; McKeown 1948: 99; Wooldridge 1976: 459; Matthews 1982: 55; Hansen 1999: 113.

Hydrobius nitidiusculus Broun, 1880: 78 (synonym of *pygmaeus*).

Paracymus nitidiusculus (Broun): Sharp 1884: 467; Blackburn 1888: 820-821.

Paracymus metallescens Fauvel, 1883: 352; Knisch 1924: 166; d'Orchymont 1926: 376 (synonym of *pygmaeus*).

Paracymus simulatus Wooldridge, 1976: 461 – New Guinea and S. Celebes

Paracymus spenceri Blackburn, 1896: 256 – Western and Central Australia; d'Orchymont 1942: 59; Wooldridge 1976: 454; Hansen 1999: 114.

Paranacaena spenceri (Blackburn): Knisch 1924: 168.

Paracymus watsi Gentili, 2000: 117 – Australia.

Paracymus phalacroides Wooldridge 1978: 129; Hansen 1999: 112.

Paracymus weiri Gentili: 119 – Western Australia.

**Holotropical Kingdom Rapoport (1968).
Ethiopic Region Sclater (1858).**

Paracymus alluandianus Scott, 1913: 201; d'Orchymont, 1926: 377 - Seychelles Island.

Paracymus amplus Wooldridge, 1977: 384 – South Africa.

Paracymus chalceus Régimbart, 1903: 32; 1906: 263 - South of Sahara.

Paracymus exiguus Wooldridge, 1977: 382 – Rhodesia.

Paracymus incomptus Wooldridge, 1977: 386 - Ethiopia, Kenya, Uganda, Rwanda.

Paracymus minor Régimbart, 1903: 33; 1906: 263 - Madagascar, Central Africa, Mauritius, Mauritania, Mozambique, Zaire, Gabon, Kenya, Malawi, Ghana, Nigeria, South Africa, Reunion Island, Rhodesia, Southeast Africa, Tanzania, Uganda, Senegal.

Paracymus punctillatus minor d'Orchymont, 1947: 726.

Paracymus monticola Wooldridge, 1997: 384 - Ethiopia.

Paracymus ornatus Wooldridge, 1977: 377 – South Africa.

Paracymus petulans Wooldridge, 1977: 378 – Rhodesia.

Paracymus pisanus Balfour-Browne, 1954: 106 - South Africa.

Paracymus proprius Wooldridge, 1977: 383 – Rhodesia.

**Holotropical Kingdom Rapoport (1968).
Eastern Region Wallace (1876).**

Paracymus atomus d'Orchymont, 1926: 378 – Southeast Asia and the Philippines.

Paracymus punctillatus atomus d'Orchymont 1926: 378.

Paracymus diligens Wooldridge, 1977: 122 – Singapore and Sumatra.

Paracymus orientalis Wooldridge, 1975: 18.

Paracymus evanescens orientalis d'Orchymont, 1926: 377 – The Philippines, Japan, China, Vietnam.

Paracymus evanescens (Sharp, 1890: 349) – Ceylon.

Hydrobius evanescens Sharp, 1890: 349.

Paracymus evanescens d'Orchymont, 1926: 377.

Paracymus generosus Wooldridge, 1977: 127 – Bali.

Paracymus mimicus Wooldridge, 1977: 123 – Laos and Thailand.

Paracymus pusillus Wooldridge, 1977: 124 – Kahang y Malaya.

Paracymus vulgatus Wooldridge, 1977: 120 – Nepal, India, Ceylon and Pakistan.

Holarctic Kingdom Heilprin (1887).

Nearctic Region Sclater (1858).

Paracymus communis Wooldridge, 1966: 718 – USA.

Paracymus confluens Wooldridge, 1966: 716 – USA and Northern Mexico.

Paracymus confusus Wooldridge, 1966: 719 – USA and Northern Mexico.

Paracymus elegans (Fall, 1901) – USA and Northern Mexico.

Creniphilus elegans Fall, 1901.

Paracymus degener (Horn, 1890) – USA.

Creniphilus degener Horn, 1890-

Paracymus despectus (LeConte, 1863) – USA.

Hydrobius despectus LeConte, 1863.

Paracymus dispersus Wooldridge, 1966: 721 – USA.

Paracymus ellipsis (Fall, 1910) – USA and Northern Mexico.

Creniphilus ellipsis Fall, 1910.

Paracymus lodingi (Fall, 1910) – USA and Northern Mexico.

Creniphilus lodingi Fall, 1910).

Paracymus nanus (Fall, 1910) – USA and Northern Mexico.

Creniphilus ellipsis var. *nanus* Fall, 1910.

Paracymus reductus (Fall, 1910) – USA.

Creniphilus reductus Fall, 1910.

Paracymus restrictus Wooldridge, 1966: 722 – USA.

Paracymus seclusus Wooldridge, 1978: 401 – USA.

Paracymus securus Wooldridge, 1975: 81 – USA.

Paracymus subcupreus (Say, 1825: 161) - USA and Northern Mexico.

Hydrobius subcupreus Say, 1825: 161.

Paracymus tarsalis Miller, 1963: 91 – USA.

Holotropical Kingdom Rapoport (1968).

Neotropical Region Sclater (1858).

Paracymus (Escotadus) acostae García y Jiménez-Ramos, 2020: 105 - Venezuela.

Paracymus acutipennis Wooldridge, 1971: 400 – Cuba.

Paracymus (Paracymus) ailuzus García y Jiménez-Ramos, 2022c: 169 - Venezuela.

Paracymus (Escotadus) aitanae García y Jiménez-Ramos, 2020: 109 – Venezuela.

- Paracymus (Lineolu) arcuatus* García, 2022b: 53 - Venezuela.
Paracymus armatus Sharp, 1882 – México y Centroamérica.
Paracymus (Escotadus) balkei García y Jiménez-Ramos, 2020: 110 - Venezuela.
Paracymus (Escotadus) barrosi García, 2022a: 74 - Venezuela.
Paracymus (Escotadus) benettii García, 2021b: 29 - Venezuela.
Paracymus (Escotadus) botanicus García, 2024: 23 - Venezuela.
Paracymus (Escotadus) burronegrus García, 2021b: 30 - Venezuela.
Paracymus (Paracymus) ceuta García, 2022b: 44 - Venezuela.
Paracymus (Lineolu) chorroelindius García, 2022b: 55 - Venezuela.
Paracymus (Lineolu) convexus García, 2022b: 56 - Venezuela.
Paracymus corrinae Wooldridge, 1969: 418 – Costa Rica, British Honduras, Guatemala, México, Nicaragua, Panamá.
Paracymus decolor – South America.
Paracymus delatus Wooldridge, 1971: 401 – Virgin Islands, Puerto Rico, Dominicana.
Paracymus elegans Fall, 1901 – México.
Paracymus (Lineolu) fannyae García, 2022b: 48 - Venezuela.
Paracymus fuscatus Wooldridge, 1989: 282 – Ecuador.
Paracymus inconditus Wooldridge, 1989: 283 - Ecuador
Paracymus (Escotadus) indigens Wooldridge, 1969: 419 – Honduras, Costa Rica, El Salvador, Guatemala, México, Nicaragua.
Paracymus insularis Wooldridge, 1973: 119 – Colombia.
Paracymus (Escotadus) gavilanensis García y Jiménez-Ramos, 2022c: 176 - Venezuela.
Paracymus (Escotadus) gavilanus García y Jiménez-Ramos, 2022c: 179 - Venezuela.
Paracymus giganticus Wooldridge, 1973: 117 – Colombia.
Paracymus (Escotadus) gilsoni García, 2022a: 77 - Venezuela.
Paracymus gracilis – South America.
Paracymus graniformis – South America.
Paracymus granulum – Brazil.
Paracymus gratus - North and east of South America.
Paracymus (Lineolu) hemisphaericum García, 2022b: 59 - Venezuela.
Paracymus (Paracymus) insularis Wooldridge, 1973: - Colombia, Venezuela.
Paracymus (Escotadus) jirehae García y Jiménez-Ramos, 2022c: 182 - Venezuela.
Paracymus (Escotadus) lagoxidacius García, 2022a: 81 - Venezuela.
Paracymus (Paracymus) lara García, 2021a: 202- Venezuela.

- Paracymus (Escotadus) liliae* García y Jiménez-Ramos, 2022c: 185 - Venezuela.
- Paracymus (Escotadus) magnum* García, 2022b: 48 – Venezuela.
- Paracymus (Escotadus) maracaiboensis* García, 2022b: 48 - Venezuela.
- Paracymus (Escotadus) marinus* García y Jiménez-Ramos, 2020: 114 - Venezuela.
- Paracymus (Paracymus) melvae* García, 2021a: 203 - Venezuela.
- Paracymus (Paracymus) mercedesae* García y Jiménez-Ramos, 2020: - Venezuela.
- Paracymus mexicanus* Wooldridge, 1969: 415 – México.
- Paracymus (Paracymus) ovalus* García, 2022a: 85 - Venezuela.
- Paracymus (Escotadus) pallidecius* García, 2024: 25 - Venezuela.
- Paracymus (Escotadus) pemonus* García, 2021a: 31 - Venezuela.
- Paracymus (Paracymus) petiti* García, 2021a: 207 - Venezuela.
- Paracymus (Paracymus) piaroa* García, 2021a: 205 - Venezuela.
- Paracymus placidus* Wooldridge, 1973: 119 – Brazil.
- Paracymus (Escotadus) ramosae* García y Jiménez-Ramos, 2020: 118 - Venezuela.
- Paracymus regularis* Wooldridge, 1969: 417 – México, Guatemala.
- Paracymus robustus* Wooldridge, 1973: 116 – Brasil, Bolivia.
- Paracymus rufocinctus* Bruch, 1915 – Suramérica.
- Paracymus (Escotadus) samariapus* García, 2021b: 32 – Venezuela.
- Paracymus (Escotadus) sandovali* García, 2024: 27 - Venezuela.
- Paracymus (Lineolu) sanozamaus* García, 2022b: 62 – Venezuela.
- Paracymus secretus* Wooldridge, 1973: 436 – México.
- Paracymus sedatus* Wooldridge, 1973: 121 – Argentina.
- Paracymus spangleri* Wooldridge, 1969: 415 – El Salvador, Costa Rica, Guatemala, Honduras, Nicaragua.
- Paracymus (Escotadus) solarys* García y Jiménez-Ramos, 2020: 120 – Venezuela.
- Paracymus (Escotadus) surensis* García, 2024: 30 - Venezuela.
- Paracymus (Escotadus) toboganensis* García, 2024: 32 - Venezuela.
- Paracymus (Paracymus) tomuso* García, 2021a: 208 – Venezuela.
- Paracymus toleratus* Wooldridge, 1973: 434 – México.
- Paracymus (Escotadus) torresi* García, 2024: 34 - Venezuela.
- Paracymus (Escotadus) tuberiasus* García, 2022a: 87 - Venezuela.
- Paracymus (Escotadus) venezuelae* García, 2022a: 90 - Venezuela.
- Eumetacymus virescens* Brèthes, 1922
- Paracymus (Escotadus) yanomami* García, 2021b: 35 - Venezuela.
- Paracymus (Paracymus) yaruro* García, 2021a: 210 - Venezuela.

Paracymus (Escotadus) zulianorum García, 2022b: 51 - Venezuela.

Paracymus (Escotadus) zulianus García, 2021b: 37 - Venezuela.

Holarctic Kingdom Heilprin (1887).

Palaearctic Region Sclater (1858).

Paracymus aeneus (Germar: 1824: 96) – Asia, Europe and North Africa.

Hydrophilus aeneus Germar, 1824: 96.

Hydrobius punctulatus Sturm, 1836: 15.

Hydrobius salinus Bielz, 1851: 152.

Laccobius cupreus Dalla Torre, 1877: 68.

Paracymus chalceolus (Solsky, 1876: 149) - Asia Minor and southern Russia.

Paracymus caucasicus Kuwer, 1889 (1890): 28. Synonymized by d'Orchymont, 1926: 69.

Paracymus phalacroides (Wollaston, 1867: 47) - Southern Europe, Northwest Africa and the Canary Islands.

Paracymus punctillatus Rey, 1884 (1885): 31. Synonymized by Balfour-Browne, 1939: 292.

Paracymus maximus de Peyerimhoff, 1929: 120 Tunisia.

Paracymus relaxus Rey, 1884: 3 – North Africa to Asia Minor.

Paracymus schneideri Kuwer, 1888: 293. Synonymized by d'Orchymont, 1929: 69.

Paracymus scutellaris (Rosenhauer, 1856: 57) – North Africa, Eastern and Southern Europe.

Hydrobius scutellaris Rosenhauer, 1856: 57.

Paracymorphus globuloides Kuwer, 1819: 28. Synonymized by d'Orchymont, 1937: 251.

Anacaena nigroaeneus Sahlberg, 1875: 14. Synonymized for Rey, 1884 (1885): 31.

Paracymus zaitzevi Shatrovskiy, 1989: 190 – Asia, Europe and North Africa.

DISCUSSION

Distribution of *Paracymus* Thomson, 1867.

Aquatic beetles of the genus *Paracymus* are distributed in various regions of the world. However, their distribution is not uniform and varies considerably among species. *Paracymus* is closely associated with freshwater bodies (García *et al.* 2016). These wetlands or lentic habitats such as lakes, ponds and pools are a determining

factor for its distribution. Geographic barriers such as mountains, oceans and deserts may limit species dispersal. Past geological events, such as glaciations and sea level changes, have influenced the current distribution of species.

There are certain regions of the world where a greater diversity of *Paracymus* species is concentrated. Some of the most important centers of diversity include the Neotropical region (76) of South and Central America, especially the tropical and subtropical zones (Wooldridge 1969, 1971, 1973, 1976ab, 1978; García y Jiménez 2020, García 2021ab, 2022abc, 2024), the Eastern (8) region of Southeast Asia and Malay Archipelago, Ethiopic (11), and Australian (14) (Wooldridge 1976, 1977ab; Gentili 2000; Minoshima 2014), Palearctic (7) (Wooldridge 1978a), and Nearctic (16) (Wooldridge 1966, 1976, 1978b). These regions often have a wide variety of aquatic habitats, which favors speciation and coexistence of multiple species. Past geological events have resulted in a great diversity of environments and have promoted isolation of populations, leading to the formation of new species.

Of 131 species of the genus recorded worldwide, the greatest diversity is present in the Neotropical region with 76 species, where the diversity of environments is one of the most diverse in the world.

Anomalous Distribution.

The finding of *P. phalacroides*, a typically Palearctic species, in Argentina (Neotropical) and Australia (Australian) is, a priori, surprising and puzzling (Wooldridge 1978a). D'Orchymont, in 1942, after detailed analysis, confirmed the identification of these specimens as belonging to the species *P. phalacroides* (Wooldridge 1978a). This suggests a much wider distribution than initially believed for this species. However, Wooldridge, in 1978, expressed some reservations, especially with respect to the Australian specimens. Although he considered that these might correspond to *P. phalacroides*, he suggested that their presence in Australia might be the result of an accidental introduction, arguing that the lack of evidence of established populations of *P. phalacroides* in Argentina and Australia pointed, possibly through the transport of goods or other vectors.

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